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13. ABSTRACT Describes a method for evaluation of landing mat sets operational and functional performance characteristics. Identifies supporting tests, facilities, and equipment required. Provides procedures for functional performance tests.			

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U. S. ARMY TEST AND EVALUATION COMMAND
SYSTEM SERVICE TEST OPERATIONS PROCEDURE

AMSTE-RP-702-106

Test Operations Procedure 7-3-070

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MAT SETS, LANDING

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SECTION I
GENERAL

1. Purpose and Scope. This TOP is to be used to test landing mat sets used in the construction of assault runways, taxiways, and apron surfacings for temporary airfields. Test phases include emplacement and flight operations of fixed and rotary wing aircraft.

2. Background. The need for prefabricated airfield surfacing materiel was established in the early days of World War II. As a result, pierced steel plank (PSP) was developed. By the end of WWII, several forms of PSP and pierced aluminum plank (PAP) were in use. Runways constructed from PSP AND PAP have faults due to the holes in the planking. The holes permit water to enter and soften the subgrade under the mat. When dry, the soil exposed through the holes is subject to erosion from propeller wash, jet blast and S/VTOL downwash impingement with a resulting dust problem. Modern concepts of mobility have intensified the demand for landing mats. Items currently in use meet the requirements for light, medium, and heavy duty mats based on sustained coverages and single wheel loads and are constructed of steel or aluminum.



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3. Equipment and Facilities. As defined in the tests listed in Section II and the following:

- a. Soil sampling and testing equipment.
- b. Surveying equipment, as required.

SECTION II TEST PROCEDURES

4. Supporting Tests. Common Service TOP's, the test defined in Section III, and other published documents to be considered in formulating a service test plan are as follows:

<u>TEST SUBJECT TITLE</u>	<u>PUBLICATION NO.</u>
a. Operator Training and Familiarization	10-3-501
b. Safety Hazards	2-3-501
c. Preoperational Inspection and Physical Characteristics	2-3-500
d. Functional Suitability (refer to para 5)	
e. Human Factors Engineering	2-3-516
f. Surface Transportability (Vehicles)	2-3-519
g. Airportability, Internal - Suitability of Supplies and Equipment for	7-3-515
h. Airportability, External - Suitability of Supplies and Equipment for	7-3-516
i. Maintainability	2-3-502
j. Maintenance Evaluation - Tools and Test Equipment	2-3-527
k. Maintenance Evaluation - Technical Manuscripts and Manuals	2-3-528
l. Reliability	2-3-507

A	BT	DATE	TIME
	BY	DATE	TIME
TEST	AVAIL. AND/OR SPECIAL	WHITE SECTION	BLUE SECTION
		<input type="checkbox"/>	<input type="checkbox"/>

SECTION III
SUPPLEMENTARY INSTRUCTIONS

5. Functional Suitability.

a. Objective. To determine the suitability of the test item for use as an airfield surfacing medium capable of supporting heavy wheel loads on weak soils as defined by the Materiel Needs (MN) or applicable requirement documents.

b. Method. Select an airfield site using criteria stated in USAF TAC Manual No. 86-1 (ref 2 appendix). Determine load bearing strength and prepare the site as described in TM 5-330 (ref 3, appendix). (In the event an existing airfield is being used as the test site, the layout may be modified to fit existing runway and taxiway layout.) Construct an assault runway in accordance with manufacturer's instructions, or per TM 5-337 (ref 4, appendix). Perform aircraft operations with critical aircraft loaded to maximum allowable gross weight. Aircraft operations should include taxiing, locked wheel turns, run-up with locked brakes, normal and maximum performance take-offs, normal landings and landings with maximum braking and reverse thrust procedures. Perform these operations at both ends of the test runway under day and night and various weather conditions. Conduct rotary wing operations in accordance with prescribed procedures to include normal, shallow and steep approaches to a hover and to touchdown, running landings, and normal, maximum performance and running take-offs. Sufficient aircraft operations will be conducted to evaluate reliability requirements of the test item. Recover the test mat and prepare for shipment as prescribed in applicable technical publications.

c. Data Required.

- (1) Nomenclature of test item and quantity required for test runway.
- (2) Site conditions and preparation required.
- (3) Time and personnel required for assembly and disassembly.
- (4) Deficiencies and shortcomings observed in installation and recovery, and aircraft operations.
- (5) Pilot comments during taxiing, landing, and take-off operations as to aircraft control, performance braking, depth perception, light reflectivity, surface roughness and vibration.
- (6) Remarks concerning overall operation of the test item.

d. Analytical Plan. Evaluation test results to determine whether or not test items meet stated performance requirements.

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**APPENDIX
REFERENCES**

1. AR 70-38, Research, Development, Test, and Evaluation of Materiel for Extreme Climatic Conditions.
2. U. S. Air Force TAC Manual No. 86-1, Landing Zone Criteria for C130 Aircraft, May 1965.
3. TM 5-330, Planning and Design of Roads, Airbases, and Heliports in the Theater of Operations.
4. TM 5-337, Paving and Surfacing Operations.